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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Textile machinery and accessories — Guide rollers for dyeing and finishing machinery — Main dimensions

Matériel pour l'industrie textile — Rouleaux de guidage pour machines de teinture et d'apprêt — Dimensions principales

Reference number
ISO 5249 : 1988 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5249 was prepared by Technical Committee ISO/TC 72, *Textile machinery and allied machinery and accessories.*

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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INTERNATIONAL STANDARD ISO 5249 : 1988 (E)

Textile machinery and accessories — Guide rollers for dyeing and finishing machinery — Main dimensions

1 Scope and field of application

This International Standard lays down a range of nominal values of external and spindle diameters, and gives information on the working performance requirements for steel guide rollers used with dyeing and finishing machinery.

2 References

ISO 1505, *Textile machinery and allied machinery and accessories — Dyeing and finishing equipment — Working widths and nominal widths.*

ISO 1940-1, *Mechanical vibration — Balance quality requirements of rigid rotors — Part 1: Determination of permissible residual unbalance.*

ISO 2013, *Textile machinery and accessories — Beams — Method of measuring variations of form and position.*

ISO 4200, *Plain end steel tubes, welded and seamless — General tables of dimensions and masses per unit length.*

3 Types of roller

See figures 1 and 2.

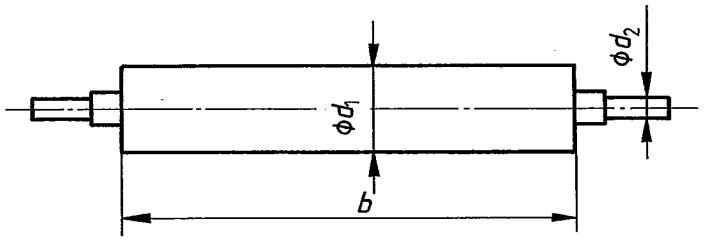

Figure 1 — Type A: Revolving spindle

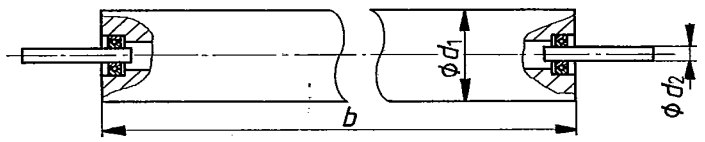

Figure 2 — Type B: Fixed spindle

4 Dimensions

4.1 External diameter of roller, d_1

See table 1.

Table 1

Dimensions in millimetres

Range	d_1 [1]														
1 [2]			85		110			135				165			215
2 [2]			85		110			135				165			215
3	60	80		100		120					160			200	
4							125		140	150			175		

1) The overall roller oscillation on diameter d_1 can be determined according to the measuring method described in ISO 2013.

2) The indicated values of these ranges take into account the machining of the external diameter of these tubes.

NOTE — Range 1 is taken from a reduced series 1 of tubes (and accessories) in non-alloy and alloy steels from group 1 in ISO 4200.

Range 2 is taken from a reduced series 1 of tubes (and accessories) in stainless steel from group 1 in ISO 4200.

Range 3 is taken from a reduced series 2 from group 2 in ISO 4200 (precision tubes).

Range 4 is taken from a series of diameters of tubes with coatings in plastic or rubber.

4.2 Diameter of spindle, d_2

The value for spindle diameter d_2 shall be chosen with regard to the forces to be applied to the roller, and shall be in a range of values which are multiples of 5, the minimum value being 15 mm.

$d_2 = 15 - 20 - 25 - 30 - 35 \ldots$ mm

4.3 Nominal width, b

The nominal width b of the rollers is specified in ISO 1505.

5 Working performance requirements

The following data are standard data; the predominant decisive criterion shall be the perfect passage of the fabric over the roller.

5.1 Admissible bending

Four quality classes for designation of the bending are set. The relevant criterion for the choice of the quality class is the purpose of application. The reference number of the quality class corresponds to the admissible bending in millimetres per metre nominal width of the roller, on the basis of an equally distributed line load of 250 N/m. Varying loads result in nearly proportional alterations in bending.

Depending on the quality class, the limiting values for the nominal roller widths, the standardized diameters of roller, and three chosen wall thicknesses of roller are given as examples in table 2. The calculated values are rounded to the nominal widths of the rollers in accordance with ISO 1505. The roller shafts and method of bearing are not taken into account. The bending by dead-weight is considered in the values given. The tensile force in the fabric web corresponds to half the line load when the roller is wrapped to an angle of 180°.

5.2 Admissible run-out

The admissible run-out of the roller shall not exceed 0,5 mm per metre of the roller width.

5.3 Admissible residual imbalance

The admissible residual imbalance of the rollers shall not exceed balance quality class G40 (see ISO 1940-1).

6 Designation

A guide roller shall be designated by the following information in the order given:

a) "Guide roller";

b) reference to this International Standard;

c) its type;

d) the number of the range;

e) its external diameter d_1;

f) its spindle diameter d_2;

g) its nominal width b;

h) its quality class.

This can be completed by any useful complementary information.

Example:

A guide roller with a fixed spindle (type B), of the range 2, with external diameter d_1 = 100 mm, spindle diameter d_2 = 30 mm, nominal width b = 1 800 mm and quality class 0,5 shall be designated as follows:

Guide roller ISO 5249 - B2 - 100 × 30 × 1 800 - 0,5

Table 2

Dimensions in millimetres

Quality class	Roller wall thickness s	Roller diameter, d_1														
		60	80	85	100	110	120	125	135	140	150	160	165	175	200	215
		Roller width, b														
2	2	2 600	3 400	3 600	4 000	4 400	4 800	5 200	5 200	5 600	6 000	6 400	6 800	7 200	7 600	8 800
	4	3 000	4 000	4 000	4 800	5 200	6 000	6 000	6 400	6 800	7 200	7 600	8 000	8 400	8 800	10 000
	6	3 200	4 400	4 400	5 200	5 600	6 400	6 400	6 800	7 200	7 600	8 000	8 400	8 800	9 600	10 400
1	2	2 000	2 700	2 900	3 400	3 400	4 000	4 000	4 000	4 400	4 800	5 200	5 200	5 600	6 000	6 800
	4	2 400	3 200	3 400	4 000	4 000	4 400	4 800	4 800	5 200	5 600	6 000	6 000	6 400	7 200	8 000
	6	2 600	3 400	3 600	4 000	4 400	4 800	5 200	5 200	5 600	6 000	6 400	6 800	6 800	7 600	8 400
0,5	2	1 600	2 100	2 300	2 700	2 800	3 200	3 300	3 400	3 600	3 800	4 000	4 000	4 400	4 800	5 200
	4	1 900	2 500	2 700	3 100	3 300	3 600	3 800	4 000	4 000	4 400	4 800	4 800	5 200	5 600	6 000
	6	2 000	2 700	2 900	3 400	3 600	4 000	4 000	4 000	4 400	4 800	5 200	5 200	5 600	6 000	6 400
0,25	2	1 300	1 700	1 800	2 100	2 200	2 500	2 600	2 700	2 900	3 100	3 300	3 400	3 600	3 800	4 400
	4	1 500	2 000	2 100	2 500	2 600	3 000	3 100	3 200	3 400	3 600	3 800	4 000	4 000	4 400	4 800
	6	1 600	2 200	2 300	2 700	2 800	3 200	3 300	3 400	3 600	3 800	4 000	4 000	4 400	4 800	5 200

Annex

Definitions and formulae

(This annex does not form an integral part of the standard.)

A.1 Calculation of roller width, b

The roller widths b are calculated by the classical formula

$$f = \frac{5 \times F \times b^3}{384 \times E \times I}$$

This gives, with the units shown in table 3,

$$b_{max} = \sqrt[3]{\frac{384 \times f_L \times E \times I}{5 \times F_L}}$$

Table 3

Symbol	Definition	Formula	Unit
b_{max}	maximum roller width	see above	cm
d_a	outer diameter of tube	$d_a = d_1$	cm
d_i	inner diameter of tube	$d_i = d_1 - 2s$	cm
E	modulus of elasticity	$E = 21 \times 10^6$	N/cm^2
f	bending of the roller	see above	mm
f_L	bending of the roller per metre	$f_L = 0{,}05$	cm/m
F	total line load		
F_L	line load per metre (load + dead-weight of roller)	$F_L = 250 + G$	N/m
G	dead-weight of roller	$G = \frac{\pi}{4}(d_a^2 - d_i^2) \times 100 \times 7{,}85 \times 10^{-2}$	N/m
I	moment of inertia	$I = \frac{\pi}{64}(d_a^4 - d_i^4)$	cm^4

A.2 Examples of results

Three examples of calculation for quality class 0,5 of steel tubes are given in table 4.

Table 4

Example No.	Designation of roller $d_1 \times s$ mm	d_a cm	d_i cm	I cm^4	G N/m	F_L N/m	b_{max} cm	Nominal width from ISO 1505 b mm
1	120 × 2	12	11,6	129,08	58,20	308,20	323,2	3 200
2	120 × 4	12	11,2	245,48	114,42	364,42	378,7	3 600
3	120 × 6	12	10,8	350,05	168,68	418,68	407,0	4 000

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Descriptors : textile machinery, dyeing equipment, rollers, specifications, dimensions, designation.

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